

*UPOGEBIA CORALLIFORA*, A NEW SPECIES OF  
CORAL-BORING SHRIMP FROM THE WEST INDIES  
(DECAPODA: UPOGEBIIDAE)

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*Abstract.*—*Upogebia corallifora*, a new species of shrimp from the West Indies, lives in boreholes that it excavates in CaCO<sub>3</sub> substrates, dead coral and Pleistocene limestone. The species, here described and illustrated, is similar in morphology to *U. noronhensis* from Arquipélago de Fernando de Noronha off northeastern Brazil. The chelae of the new species differ in having a longer fixed finger and lacking a row of spines on the lower mesial surface of the palm.

Recent ecological studies on thalassinid shrimps, *Upogebia*, in the West Indies have shown that an undescribed species of this genus constructs boreholes in “skeletons of dead coral or the dead bases of living corals” (Scott, Reiswig & Marcotte 1988), and that juveniles, here provisionally included with it, bore into limestone (Scott, Moser & Risk 1988). We describe the new species in this paper.

*Upogebia corallifora*, new species

Fig. 1

*Material examined.*—Jamaica: USNM 230075. Holotype ♀; Port Royal, Drunkenmans Cay, 3–4 m, area of dead *Siderastrea siderea* (Ellis & Solander 1786), P. J. B. Scott, Oct 1986.—USNM 230076. Paratypes, 2 ♂, 2 ♀ (1 ovig.); Port Royal, Drunkenmans Cay, approx. 2–4 m, P. J. B. Scott, 10 Oct 1986. One ♂ and one ♀ from this lot of specimens are to be deposited in the National Museum of Canada.

*Upogebia corallifora* new species ? USNM 230077. 2 ♀ (juv.), 2 juvs.; Discovery Bay, boring in Pleistocene CaCO<sub>3</sub> of an artificial reef, about 5 m depth, P. J. B. Scott, Oct 1986 (specimens softened in Aerosol OT solution after being dried).

*Diagnosis.*—Projections to either side of rostrum ending in acute spine. Postocular spine present. First and second abdominal

segment lacking ventral spines; sixth segment lacking hooked anterolateral spine. Telson subrectangular. Carpus of cheliped with one small spine on mesiodistal margin. Leg 2 with proximal mesioventral spine on merus; merus of leg 4 spineless.

*Description.*—Rostrum triangular, short, slightly downturned; tip exceeding eye-stalks; dorsal pair of strong subapical spines followed on each side by two spines successively shorter in length, and separated from first by wide interval; ornamented dorsal two-thirds of carapace surface anterior to cervical groove bearing pilose tufts, changing from spiny anteriorly to tuberculate posteriorly, and angling toward sides posteriorly; gastric surface posterior to this smooth; ornamented anterior part separated from and flanked on each side by posteriorly divergent ridge bearing crest of about 12 spines, strongest on lateral rostral process and decreasing to obsolescence posteriorly. Cervical groove deep and continuous, shoulder lateral to it bearing one obsolescent tubercle below intersection with thalassinidean line; latter continuing to posterior margin of carapace. Postocular spine present.

Abdomen broadly and smoothly arched dorsally; pleura of segment 1 narrowly rounded posterolaterally, those of 2–5 broadly rounded, with dense fine plumose

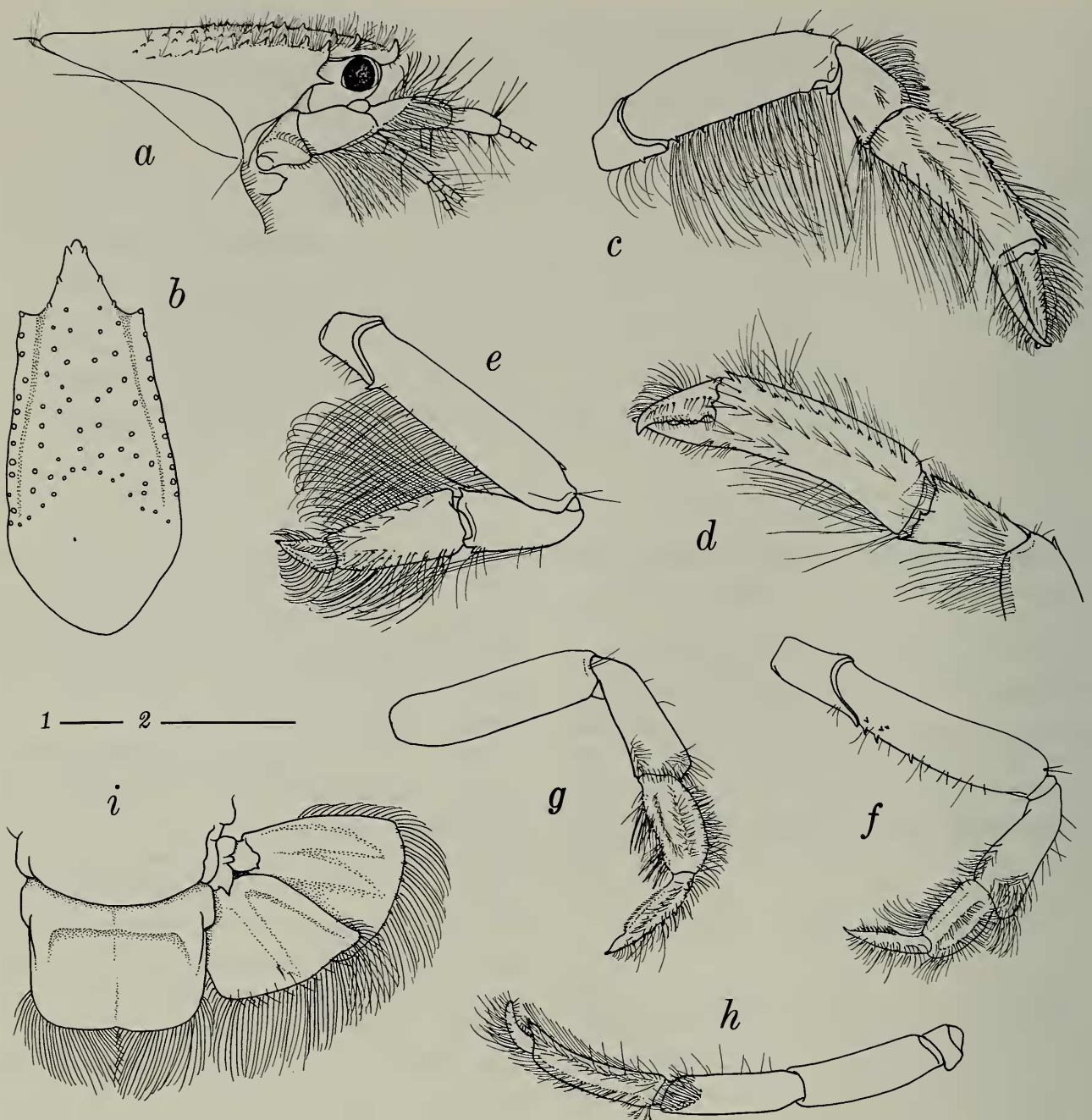


Fig. 1. *Upogebia corallifora*, ♀ holotype: a, Cephalic region, lateral; b, Anterior carapace, dorsal; c, Right cheliped, lateral; d, Same, mesial; e, Leg 2; h, Leg 5; i, Parts of abdominal segment 6, telson and uropods. Paratypes: dissociated legs 3-4, f, g. Scales: 1, a-h; 2, i; each 1 mm.

setae on posterolateral corner of terga 3-4, and in tracts on pleura of segments 3-5; segment 6 subrectangular, wider than long, lateral margin sinuous, adapted for interlocking with extended uropodal exopod, notch anterior to posterolateral lobe continuous with oblique groove and lunate dorsal impression.

Telson subrectangular, a little wider than

long, broadest proximally, angle on anterolateral margin interlocking with groove on central rib of uropodal endopod; posterior margin shallowly biarcuate and densely fringed with setae; transverse proximal ridge fairly prominent and continuous with low lateral ridges at each side; median groove obsolescent.

Eyestalk stout, deepest at about mid-



length, convex ventrally; eye narrower than diameter of stalk and directed anterolaterally.

Antennular peduncle reaching to about proximal one-fourth of terminal article of antennal peduncle, its proximal two articles together slightly longer than terminal article; flagella unequal, lower thinner ramus somewhat longer than thicker upper one.

Antennal peduncle with about one-half its length extending beyond tip of rostrum; article 2 bearing tiny subdistal ventral spine; scale moderate, oval, sometimes with minute terminal spine.

Mouthparts as figured for *U. jonesi* (Williams 1986); maxilliped 3 with epipod.

Epistomial projection rather broad in lateral view, bearing small apical spine.

Chelipeds essentially equal. Ventral margin of ischium bearing one tiny spine. Merus with single subdistal dorsal spine reaching level of postocular spine, row of five small to moderate spines on ventral margin. Carpus trigonal, shallow longitudinal groove laterally and slender spine at anterior ventrolateral corner; mesiodorsal crest of almost uniform small spines remote behind prominent spine on anterior margin and partly obscured by setae in proximal part of row, all directed distad, and three very small spines on anterodorsal margin mesial to articulation of carpus; one small spine near middle of distomesial margin, and an obsolescent spine dorsal to it. Palm oval in cross section, length including fixed finger about three times maximal height; bearing mixed prominent plumose and long setae in one sparse dorsal row, plus lateral oblique row of setae ending anteriorly in patch of long setae near base of fixed finger; mesiodorsal row of small somewhat irregular spines ending distally in small acute spine above condyle of dactyl; lower mesial surface spineless but bearing low transversely arcuate ridge proximally. Fixed finger slightly shorter than dactyl and more slender, slightly downcurved in middle and ta-

pering to slender tip, four small teeth on proximal prehensile edge. Dactyl much stouter than fixed finger, its curved upper surface bearing about three small, proximal tubercles; tip preceded on prehensile edge by more or less straight edge growing more elevated proximally and capped by obscure small teeth, then a toothless notch basally.

Leg 2 reaching about to distal one-fourth of palm; carpus with obsolescent distodorsal spine and tiny, acute, subdistal ventral spine; merus with small subdistal dorsal spine and moderate proximal mesioventral spine; coxa with strong proximal and smaller distal spine mesially. Leg 3 with slender ventral spines on proximal half. Leg 4 with spineless merus and ischium. Subchelate leg 5 reaching beyond ischium of cheliped.

Two arthrobranchs arranged in biserial rows of undivided (entire) lamellae on maxilliped 3 and legs 1–4.

Uropod with obsolescent spine on protopod above base of endopod; nearly straight distal margin of endopod exceeded by curved margin of exopod, both rami with dense fringe of setae and minute scattered spines or granules on distal margin; endopod with low, median longitudinal rib, and less prominent lateral rib having shallowly concave margin except for rounded, proximal shoulder; exopod with three ribs, mesial sturdiest one bearing obsolescent spine proximally, intermediate rib longer, lateral rib least evident of all, slightly curved outward but shallowly concave proximally.

*Measurements in mm.* — Holotype ♀, length anterior carapace 4.6, length carapace 7.3, length chela including fixed finger 4.5, greatest height chela 1.2. Paratype ♂, length anterior carapace 2.4, length carapace 3.3, chelae missing.

*Known range.* — Specimens examined are limited to Jamaican localities listed above, although one additional specimen of what appeared to be *U. corallifora* was collected from dead coral on the reef of Bellairs Research Institute, Barbados in 1981. The lat-

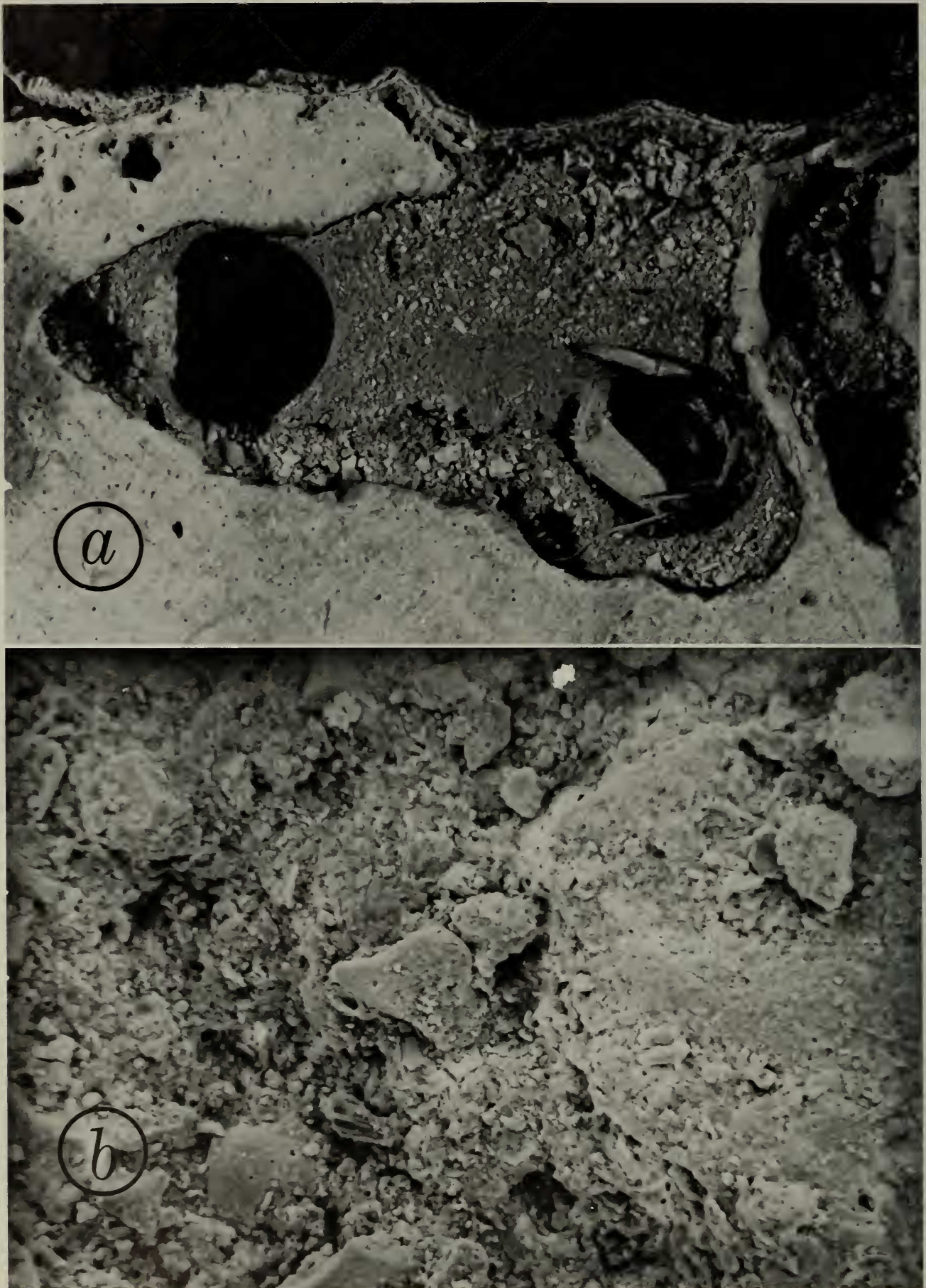


Fig. 2. a, Mud-lined borehole of juvenile *U. corallifora*? exposed in a slabbed section of Pleistocene limestone, with part of one individual intact; b, SEM micrograph  $\times 560$  of burrow lining composed of organic and inorganic constituents.



ter specimen was lost and cannot now be verified. It is possible that the species is widely distributed, though rare, in other parts of the Caribbean.

Known distribution of *U. corallifora* is patchy. No specimens were found in recent reef coral on the north coast of Jamaica, where 188 kg of coral rubble and 97 kg of living coral were surveyed quantitatively. All specimens boring in recent reef rock were found in much smaller, qualitative samples taken at Drunkenmans Cay on the south coast, near Kingston. Bioeroders are generally much more abundant in that area than on the north coast, including a species of boring mussel *Lithophaga aristata* (Dillwyn 1817) which does not occur at all in Discovery Bay on the north coast of the island (Scott 1988). Juveniles questionably referred to *U. corallifora* were, however, found in Pleistocene limestone placed in Discovery Bay during the building of an artificial reef (Fig. 2). This limestone is much harder and denser than natural, recent reef rock. These juveniles have more robust chelipeds than the adults described above, but resemble the adults in other respects. We questionably refer them to the new species until more material is available for comparative study.

*Habitat.*—The habitat of *U. corallifora* partly overlaps that of the much more abundant *U. operculata* Schmitt 1924. Both species inhabit dead coral skeletons in Jamaica, but occurrence of the former is much restricted. It has not been found with boreholes opening from living corals, which are a common habitat for *U. operculata* (Scott, Reiswig & Marcotte 1988); see Warne (1975) for distinction between boring in hard and burrowing in soft substrates. A coral-boring species, *U. trypeta* Sakai (1970, 1982), has also been reported from Japan.

Boreholes of *U. corallifora* are similar in appearance to those of *U. operculata* (Kleemann 1984; Scott, Reiswig & Marcotte 1988). Pairs of individuals (one ♂, one ♀) live in complex, multi-chambered excava-

tions which are just wide enough to allow the occupants to somersault and reverse direction. Excavations are lined with a mixture of mud, coral fragments and organic material. Energy dispersive X-ray analysis (EDAX) of borehole lining material revealed the presence of Ca, Si, Mg, Al, Cl, K & S. Openings to borings are difficult to detect on the irregular surface of dead coral; each opening lies a few millimeters below the surface in a smooth conical pit and is much narrower than the remainder of the hole to which it gives access. Adult shrimps are trapped in the borings by the restrictive openings.

*Remarks.*—*Upogebia corallifora* is similar to *U. noronhensis* Fausto-Filho 1969 (comparison made with paratype ♀♀, No. 163, carcinological collection, LABOMAR, Universidade Federal do Ceará, Brazil, Fernando de Noronha, Baía de Sueste, Fausto-Filho, 7/8/68), which in turn has some similarity to *U. spinigera* (Smith 1871) of the eastern Pacific, but *U. corallifora* is apparently a smaller and less spinose species than either of the latter. *Upogebia corallifora* keys out to *U. noronhensis* in Williams (1986: 10), but the two can be separated by means of the following emendation to the concluding couplet of his key to Atlantic species of the genus.

- Chelae with no spines proximal to fixed finger on ventral keel of palm ..... 7
- 7. Chela with fixed finger about equal in length to dactyl; palm spineless on lower mesial surface ..... *U. corallifora*, n. sp.
- Chela with fixed finger about 1/2 length of dactyl; palm with row of more or less distinct spines on lower mesial surface ..... *U. noronhensis* Fausto-Filho

*Etymology.*—The name, a noun form from the Latin “corallum,” coral, and “foro,” bore or pierce, alludes to the coral-boring capabilities of the species.

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